

A new *Sapromyza* Fallén, 1810, from the Swiss Alps (Diptera, Lauxaniidae)

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A new *Sapromyza* Fallén, 1810, from the Swiss Alps (Diptera, Lauxaniidae). - A new Western Palaearctic *Sapromyza* with a rather well-developed presutural dorsocentral seta is described and illustrated. Its phylogenetic position is briefly discussed. Keys to the Western Palaearctic genera of the *Sapromyza*-*Lyciella* group of genera and to the Western Palaearctic species of the *Sapromyza obsoleta* group are given.

Keywords: Diptera - Lauxaniidae - *Sapromyza* - new species - Switzerland.

INTRODUCTION

Sapromyza Fallén, 1810, is a heterogeneous genus of Lauxaniidae which is widespread in the Old and New World. Some 600 species have been described so far as «*Sapromyza*», and over half of them are still placed in this genus. It belongs to the subfamily Lauxaniinae and is defined by negative characters, like the absence of a postsutural intra-alar seta, without a well-developed presutural dorsocentral seta, without setulae on the anepimeron, a flat face, bare veins, and antennae without particularities. Already Stuckenberg (1971, p. 570) pointed out that the species of *Sapromyza* are grouped together through a paraphyletic assemblage of characters and their separation from *Lyciella* Collin, 1948, and other genera is not always possible. *Lyciella*, for instance, differs from *Sapromyza* by the presence of a strong presutural dorsocentral seta and some fine setulae on the anepimeron (see Merz, 2003, for details) but some «intermediate» species of *Sapromyza* with 1-3 (smaller) presutural dorsocentral setae are known (best seen in the type-species of *Sapromyza*, *S. obsoleta* Fallén) and some *Lyciella* lack the fine setulae on the anepimeron (these species are now placed in two different genera: *Poecilolycia* Shewell, 1986, and *Pseudolyciella* Shatalkin, 2000). Stuckenberg (1971) observed also that most Australasian and Neotropical «*Sapromyza*» have a strong presutural dorsocentral seta but he did not propose new genera for them.

Recently, a pair of a «*Sapromyza*» with a distinct presutural dorsocentral seta was found in Switzerland. It is described here as a new species of the *S. obsoleta* group which includes in the Western Palaearctic Region the following species: *S. amabilis* Frey, 1930, *S. apicalis* Loew, 1847, *S. obsoleta* Fallén, 1820, *S. schnabli* Papp, 1987,

S. setiventris Zetterstedt, 1847, and *S. simplicior* Hendel, 1908. The group is defined by the following characters: body subshining yellow brown (partly grey in *S. simplicior*), frons rather strongly shining; apex of postpedicel black; head in profile with higher gena than width of postpedicel and wide parafacial; postpedicel dorsally concave, about twice as long as wide; abdomen without black spots on tergites.

The two specimens from Switzerland differ from other Western Palaearctic genera superficially resembling *Sapromyza* (e. g., *Aulogastromyia*, *Cnemacantha*, *Eusapromyza*, *Lyciella*, *Mycterella*, *Neoparoecus*, *Poecilolycia*, *Pseudolyciella*, *Tricholauxania*) in diagnostic characters (Papp & Shatalkin, 1998; Shatalkin, 2000; Merz, 2003, and see key below). It is therefore reasonable to place this species in *Sapromyza* pending a cladistic analysis of the genera involved in this complex.

MATERIAL AND METHODS

The specimens of this study are deposited in the Muséum d'histoire naturelle Genève (MHNG). Terminology follows the first chapter in Papp & Darvas (2000), except for the terms of the antennae which are according to Stuckenberg (1999).

SYSTEMATIC PART

Sapromyza alpina sp. n.

Figs 1-15

MATERIAL: Holotype ♂, **Switzerland:** VS, Jeitzinen, 1550 m, 26.VI.1999, Merz & Eggenberger (MHNG). Paratype: 1 ♀, **Switzerland:** VS, Visperterminen, 1400 m, 24.VII.1993, leg. B. Merz (MHNG).

The holotype is double mounted on a minuten pin on a polyporus block. It is in moderate condition, with some setae on head and mesonotum broken.

ETYMOLOGY

The name is derived from the Alps, the mountains of the type locality.

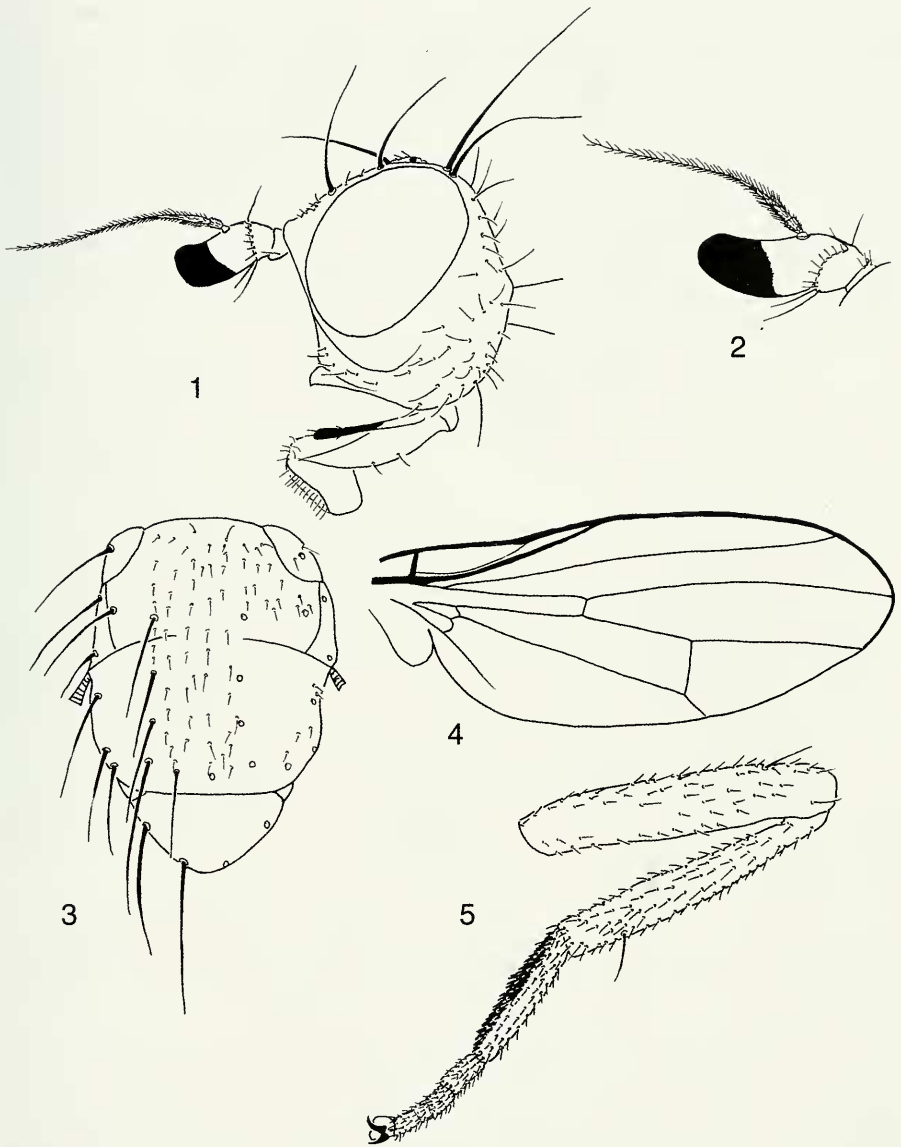
DIAGNOSIS

A yellow brown, rather strongly shining species which is placed despite the presence of a presutural (and 3 postsutural) dorsocentral setae in *Sapromyza*. Apical half of postpedicel and palpus black; 4-6 rows of short acrostichal setae present; no postsutural intra-alar seta; 2 katapisternal setae; no anepimeral setae or setulae; anterior tarsus contrastingly black; hind basitarsus in male ventrally along entire length with a brush of black setulae; wing hyaline, without setulae on veins; hind margins of tergites in female without longer setae or setulae; terminalia in both sexes characteristic.

DESCRIPTION MALE

Wing length: 4.1 mm.

Head: Colouration - Ground colour yellow brown, with strongly shining frons, fronto-orbital plates, and occiput; face paler yellowish, matte; parafacial and gena slightly microtrichose, dull; occiput dorsally of neck with a white, more or less shining patch; apical half of postpedicel, arista except for basal two segments, and apical half of palpus contrastingly black, sharply separated from yellow bases (especially in postpedicel). *Structure* - In profile 1.1 times higher than long, with strongly developed occiput; gena with 2 somewhat irregular rows of black setulae along ventral margin;



FIGS 1-5

Sapromyza alpina sp. n. (1) Head, lateral view (female paratype). (2) Antenna in largest extension (female paratype). (3) Thorax, dorsal view (female paratype, setae only drawn on left side, setulae on right side). (4) Wing (male holotype, drawn in situ). (5) Hind leg of male holotype, anterior view.

1.2 times higher than width of postpedicel and about one third as high as compound eye; the latter about 1.3 times higher than long; parafacial about one third as wide as width of postpedicel; frons medially with a slight depression; about 1.7 times wider than compound eye and about 1.15 times wider than long (measured between posterior

margin of posterior ocelli and lunule); in anterior third with about 15 black setulae; face more or less flat. *Antenna* – Scape shorter than wide, dorsally with few black setulae; pedicel about as long as wide, apically with the usual circle of black setulae and one stronger seta dorsally; postpedicel about twice as long as wide, dorsally slightly concave, tip apico-dorsally smooth; arista short setulose, longest rays about as long as diameter of arista at base. *Mouthparts* – Palpus with short, black, stiff setulae. *Chaetotaxy* – 2 probably reclinate fronto-orbital setae (all broken), 1 short ocellar seta reaching base of anterior fronto-orbital seta, inserted distinctly within the triangle of 3 ocelli; 1 inclinate medial vertical seta; 1 ecline lateral vertical seta; postocellar seta inclinate, short, about as long as longest postocular setae; the latter in one row, and one additional row posterior on occiput.

Thorax: Colouration – Everywhere yellow brown, mesonotum very thinly microtrichose and therefore conspicuously subshining; pleura less shining. *Structure* – Mesonotum in lateral view almost flat, in dorsal view about 1.2 times longer than wide. *Chaetotaxy* – Acrostichal setae anterior to transverse suture in about 6 irregular rows, posterior to suture in 4 rows; setulae of medial two rows slightly longer than those of lateral rows; prescutellar acrostichal seta probably at most as long as presutural dorso-central seta (judging from size of alveolus); 1+3 dorsocentral setae, the presutural seta distinct, but slightly shorter than anterior postsutural seta; 1 presutural intra-alar seta; 2 supra-alar setae; 1 postalar seta; no posterior intra-alar seta; 1 postpronotal seta; 2 notopleural setae, the posterior slightly shorter and weaker; 2 (pairs of) scutellar setae, no additional setulae between them; 1 proepisternal seta; 1 anepisternal seta (and some black setulae in posterior half); 2 katapisternal setae; anepimeron entirely bare, without setulae ventrally of wing base; prosternum with few black setulae.

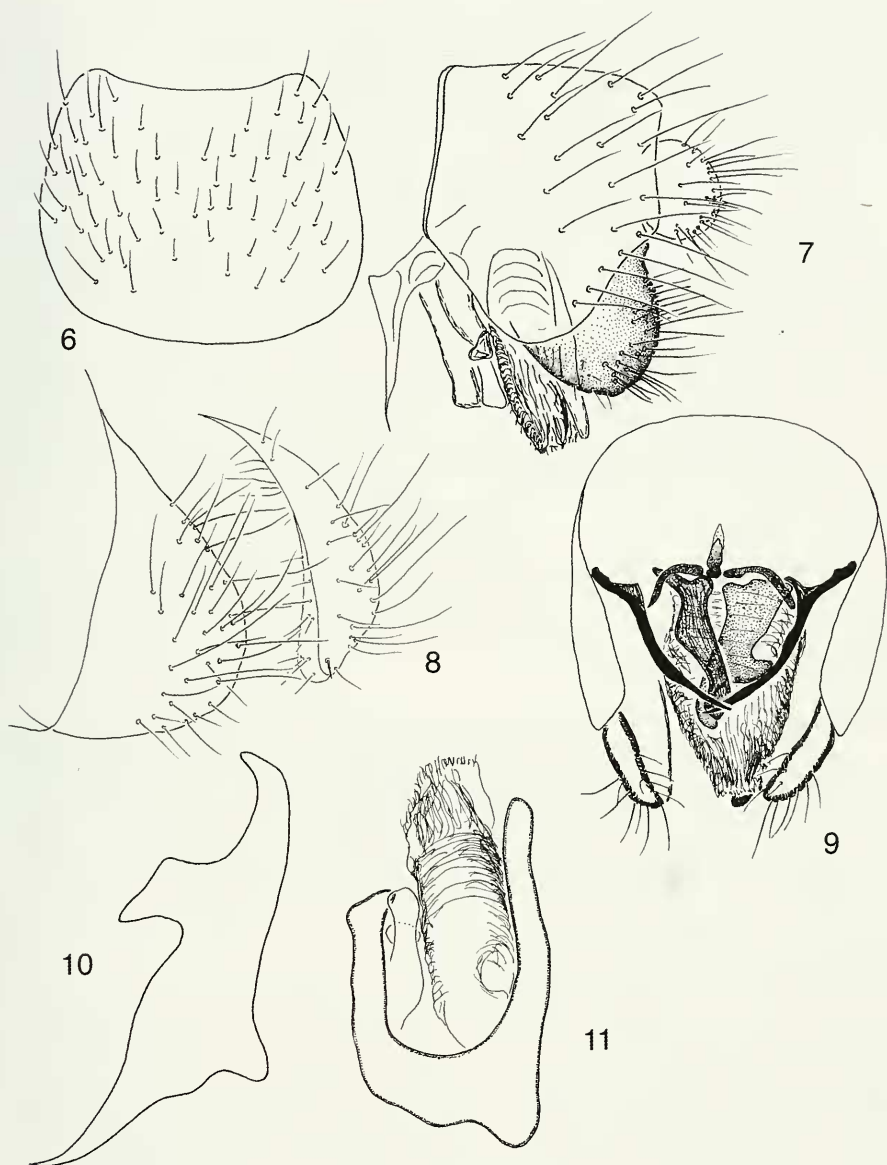
Wing (Fig. 4): Surface slightly yellowish, entirely hyaline; all veins bare; black setulae on costa ending halfway between R2+3 and R4+5; distance between R-M and DM-Cu on M1+2 about twice the length of DM-Cu; last section of M1+2 about 1.5 times longer than penultimate section (between crossveins).

Legs (Fig. 5): Yellow brown, but anterior tarsus contrastingly black; last 4 tarsal segments of mid and hind leg increasingly darker towards tip; all tibiae with a short black preapical dorsal seta; fore femur without ctenidium; hind femur with a subapical dorsal seta; mid tibia with one apical seta ventrally; hind basitarsus ventrally throughout length with a dense brush of short black setulae.

Male abdomen and terminalia (Figs 6-11): Yellow brown, less shining than mesonotum; tergites black setulose, without longer setulae at hind margins; sternite 5 (Fig. 6) posteriorly smoothly concave; epandrium in profile (Fig. 7) slightly higher than long; cercus distinctly protruding; surstylus (Fig. 8) free, setulose in ventral half, over twice as wide as high, evenly curved, without tooth on inner side; hypandrium (Fig. 9) not closed basally, with two acute clasps; pregonite (Fig. 10) of irregular shape, apically bilobate, the longer tooth apically slightly hooked; postgonite (Fig. 11) bare, consisting of two protuberances of different length; aedeagus as long as surstylus, apically with short, fine setulae.

DESCRIPTION FEMALE

Very similar to male, with following differences (condition in male in parentheses).



FIGS 6-11

Sapromyza alpina sp. n., male holotype. (6) Sternite 5. (7) Genitalia, lateral view. (8) Surstylus in largest extension. (9) Genitalia, ventral view. (10) Pregonite in largest extension. (11) Postgonite and aedeagus.

Wing length: 4.0 mm.

Head (Figs 1-2): Gena with only one distinct row of black setulae (two rows); frons about 1.25 times wider than long (1.15 times), in anterior half with about 20 black setulae (about 15 setulae); 2 reclinate fronto-orbital setae (broken off); ocellar

seta ending slightly anterior of alveolus of anterior fronto-orbital seta (ending on level of alveolus of anterior fronto-orbital seta); postocellar seta about twice as long as longest postocular seta (as long as longest postocular seta).

Thorax (Fig. 3): Acrostichal setae throughout in 4 more or less regular rows (6 rows anterior to transverse suture).

Legs: Hind basitarsus with a row of short, rather wide-set blackish setulae ventrally, which do not form a brush as in the male.

Female abdomen and terminalia (Figs 12-15): Hind margins of tergites without stronger black setae; a small, intercalary pair of sclerotized plates present between tergite 7 and tergite 8 (Fig. 12); sternite 8 of complicated structure (Figs 13-14), ventrally an apically pointed, setulose plate reaching tip of sternite 9; this plate connected at base with a lateral plate which ends in a small tooth; dorsal of this tooth is a weakly sclerotized, setulose protuberance; at base of tooth with darker sclerotization, left and right tooth connected by a weakly sclerotized «bridge»; cercus about as long as wide at base; 3 spermathecae, with smooth surface, the unpaired egg-shaped, the paired spherical.

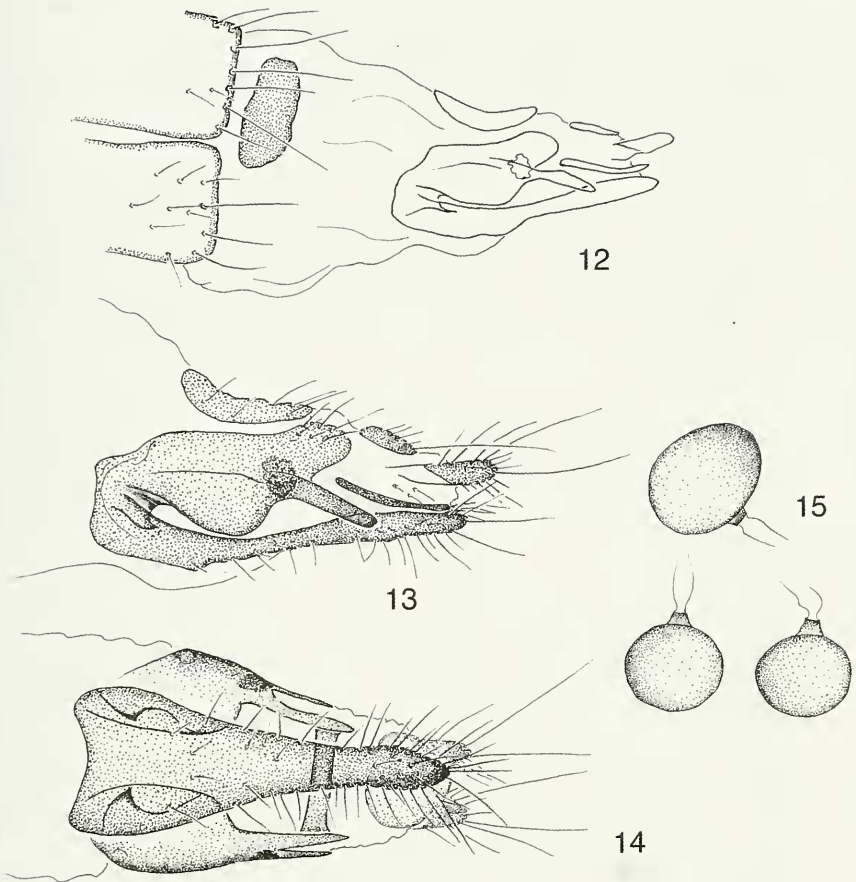
BIOLOGY

Both specimens were swept from vegetation in a dry habitat with shrubs, extensively managed meadows and open forests. They were collected between 1400 and 1600 m near the driest and hottest place in Switzerland. No further data about the biology of this species is available.

REMARKS

With the discovery of a new species with a short, but distinct presutural dorso-central seta the separation of *Sapromyza*, as it is currently defined for the Palaearctic and Nearctic Regions (Stuckenberg, 1971; Papp, 1979; Papp & Shatalkin, 1998; Shatalkin, 2000; Merz, 2003) from *Lyciella* and related genera is even more problematic. Based on its combination of characters *S. alpina* is assigned to the *Sapromyza obsoleta* group of species. However, this placement is tentative because no cladistic analysis or comparative study of terminalia of the genera of the *Sapromyza-Lyciella* group has ever been carried out.

Sapromyza alpina can be separated from other species of the genus by the presence of a rather well-developed presutural dorsocentral seta and by the combination of the entirely black anterior tarsus in both sexes, the presence of a dorsal preapical seta on hind tibia, and in the male by the ventral brush of black setulae on the hind basitarsus, but the hind tibia is unmodified. In external characters the new species can be confused with *S. obsoleta* which has the same colouration of antenna, palpus and fore tarsus, and often carries 1-3 longer setulae anterior of the 3 postsutural dorsocentral setae. *S. obsoleta* differs from the new species by the absence of the dorsal preapical seta on hind tibia (present in *S. alpina*). The male carries a brush of strong black setulae apicoventrally on hind tibia, and a curved apical spine anteriorly (no modifications of hind tibia in *S. alpina*). Another superficially similar species is *S. schnabli* with the same colouration of head and thorax, and which has also the fore tarsus darkened (but not distinctly black along entire length as in *S. alpina*). However, the hind basitarsus of the male is not modified, and the terminalia of both sexes are very different. In



FIGS 12-15

Sapromyza alpina sp. n., female paratype. (12) Last segments (intercalary sclerite dotted). (13) Genitalia, lateral view. (14) Same, ventral view. (15) Spermathecae.

S. schnabli the male surstylus is armed with a tooth on inner surface and the postgonites are short and rounded apically. The female sternite 8 is shorter and has a different shape.

KEY TO WESTERN PALAEARCTIC GENERA OF THE *SAPROMYZA-LYCIELLA* GROUP

The following key allows a separation of the Western Palearctic genera of Lauxaniinae with the combination of the following characters: Presutural intra-alar seta present; postsutural intra-alar seta absent; face straight without tubercle or rim; wing without horse-shoe like pattern.

Characters given in parentheses apply to all Western Palaearctic species of the couplet, but may also be present in some species of the alternative.

- 1a Either R2+3 or R4+5 with some setulae (always with 1+3 dorsocentral setae; at least along DM-Cu with brown infuscation) 2
- 1b Wing veins bare (Fig. 4) 3
- 2a R2+3 ventrally throughout length setulose; wing hyaline, but with brownish infuscation along DM-Cu; R4+5 bare . *Tricholauxania* Hendel, 1925
- 2b R2+3 bare, but R4+5 in basal half dorsally and ventrally with few setulae; wing with brown pattern on surface *Eusapromyza* Malloch, 1923
- 3a Mid tibia apico-ventrally with two setae (body black, 6 rows of acrostichal setae, 1+3 dorsocentral setae) *Cnemacantha* Macquart, 1835
- 3b Mid tibia apico-ventrally with one seta 4
- 4a Arista thick, covered with dense, white or brown to black rays 5
- 4b Arista slender, rays rather sparse, always dark (Fig. 2) 6
- 5a Postpedicel at most 2.5 times longer than wide; rays of arista brown to black *Neoparoecus* Özdikmen & Merz, 2006
- 5b Postpedicel at least 3 times longer than wide, rays of arista white *Mycterella* Kertész, 1912
- 6a Postpedicel almost entirely black. Male: hind basitarsus distinctly shorter than mid basitarsus; claws of hind leg asymmetrical: one claw almost as long as hind tarsus, the other claw as usual. Female: sternite 7 and tergite 7 fused, forming a sclerotized oviscap (body yellow brown; 1+3 dorsocentral setae; anepimeron with 1-3 setulae) *Aulogastromyia* Hendel, 1925
- 6b At least basal quarter of postpedicel yellow brown (Fig. 2); male and female without these modifications 7
- 7a Anepimeron with few fine, short setulae below wing base; always with 1+3 dorsocentral setae (mesonotum yellow brown, unstriped) *Lyciella* Collin, 1948
- 7b Anepimeron bare; with or without presutural dorsocentral seta 8
- 8a Ocellar setae inserted outside the triangle formed by the 3 ocelli (without presutural dorsocentral seta; body dull yellow brown including postpedicel and palpus; last 1-3 tergites of abdomen each with a pair of black spots laterally. Male: shape of postgonites very complicated, with black hooks and protuberances) *Sapromyzosoma* Lioy, 1864
- 8b Ocellar setae closer together, inserted inside ocellar triangle; combination of other characters different 9
- 9a Head and mesonotum grey, frons with a pair of brown vittae, mesonotum grey, with two pairs of brown longitudinal vittae; 1+3 dorsocentral setae which do not stand on darker spots . . *Poecilolycia* Shewell, 1986
- 9b Frons without a pair of brown vittae; combination of other characters different 10
- 10a Mesonotum usually grey, setae inserted on dark spots; always with 1+3 dorsocentral setae; 2-4 rows of acrostichal setae, those of the medial two rows almost as long as dorsocentral setae *Pseudolyciella* Shatalkin, 2000

- 10b Mesonotum black, grey, or yellow brown; setae not on dark spots; medial two rows of acrostichal setae much shorter than dorsocentral setae (Fig. 3); usually without presutural dorsocentral seta, or, if present, then mesonotum yellow brown *Sapromyza* Fallén, 1810

KEY TO WESTERN PALAEARCTIC SPECIES OF THE *SAPROMYZA OBSOLETA* GROUP

The following key allows a separation of the Western Palearctic species of the *Sapromyza obsoleta* group with the combination of the following characters: body subshining yellow brown (partly grey in *S. simplicior*), frons rather strongly shining; apex of postpedicel black; head in profile with higher gena than width of postpedicel and wide parafacial; postpedicel dorsally concave, about twice as long as wide; abdomen without black spots on tergites.

- 1a Palpus black in apical half (Fig. 1) 2
 1b Palpus yellow brown, rarely slightly infuscated 6
 2a Hind tibia without preapical dorsal seta. Male: hind tibia apicoventrally with brush of black setulae and with a curved, black spine at tip *S. obsoleta* Fallén, 1820
 2b All tibiae with a preapical dorsal seta. Male: hind tibia without modifications 3
 3a Fore basitarsus entirely black; presutural dorsocentral seta present (Fig. 3). Male: hind basitarsus ventrally on entire length with a brush of setulae (Fig. 5) *S. alpina* sp. n.
 3b Fore tarsus yellow to dark brown, at least base of basitarsus and last tarsal segment paler (yellow brown to brown); sometimes some longer setulae anterior the anteriormost postsutural dorsocentral seta present, but they are not distinctly thicker than surrounding setulae. Male: hind basitarsus without modifications 4
 4a More than apical half of postpedicel black; border between black tip and yellow brown base not sharp. Male: genitalia large, surstyli converging, apically pointed (Scandinavia and North of Russia) *S. amabilis* Frey, 1930
 4b At most apical half of postpedicel black; border between black tip and yellow brown base sharp. Male: genitalia small, surstylus not pointed apically. 5
 5a Fore tarsus yellow; less than apical half of postpedicel black. Male: surstylus without tooth on inner side; both branches of postgonite sharply pointed, longer than aedeagus. Female: tergite 3 with some distinctly longer setae along posterior margin *S. apicalis* Loew, 1847
 5b Fore tarsus brown to dark brown except for base of basitarsus and last tarsal segment; postpedicel black in about apical half. Male: surstylus with a tooth on inner side; two branches of postgonite shorter, apically not distinctly pointed. Female: tergite 3 without longer setae along posterior margin *S. schnabli* Papp, 1987
 6a Mesonotum light grey; frons with a linear dark patch medially *S. simplicior* Hendel, 1908
 6b Mesonotum uniformly yellow brown; frons without darker patch medially *S. setiventris* Zetterstedt, 1847

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REFERENCES

- MERZ, B. 2003. Einführung in die Familie Lauxaniidae (Diptera, Acalyptrata) mit Angaben zur Fauna der Schweiz. *Mitteilungen der Entomologischen Gesellschaft Basel* 52 (2-3) (2002): 29-128.
- PAPP, L. 1979. 57. abrahal. Korhadéklegyek-Pajzstetülegyek. Lauxaniidae-Chamaemyiidae. *Fauna Hungaricae* 27: 1-59.
- PAPP, L. & DARVAS, B. (eds). 2000. Contributions to a Manual of Palaearctic Diptera. Volume 1. *Science Herald, Budapest*, 978 pp.
- PAPP, L. & SHATALKIN, A. I. 1998. 3. 37. Family Lauxaniidae (pp. 383-400). In: PAPP, L. & DARVAS, B. (eds). Contributions to a Manual of Palaearctic Diptera. Volume 3. *Science Herald, Budapest*, 880 pp.
- SHATALKIN, A. I. 2000. Keys to the palaearctic flies of the family Lauxaniidae (Diptera). *Zoologicheskoe Issledovanie* 5: 1-102 (in Russian; english translation: SCHACHT, W., KURINA, O., MERZ, B. & GAIMARI, S. 2004. Zweiflügler aus Bayern XXIII (Diptera: Lauxaniidae, Chamaemyiidae). *Entomofauna, Zeitschrift für Entomologie* 25 (3): 41-80).
- STUCKENBERG, B. R. 1971. A review of the Old World genera of Lauxaniidae (Diptera). *Annals of the Natal Museum* 20 (3): 499-610.
- STUCKENBERG, B. R. 1999. Antennal evolution in the Brachycera (Diptera), with a reassessment of terminology relating to the flagellum. *Studia Dipterologica* 6 (1): 33-48.